

CLAIMS

1. A recombinant expression vector comprising in operable combination i) a nucleic acid sequence of interest, ii) a promoter sequence, and iii) one or more age regulatory sequences selected from SEQ ID NO:1, SEQ ID NO:3, a portion of SEQ ID NO:1, and a portion of SEQ ID NO:3.

2. A method, comprising:

- 10 a) providing: i) a cell, ii) a nucleic acid sequence of interest, iii) a promoter sequence, and iv) one or more age regulatory sequences selected from SEQ ID NO:1, SEQ ID NO:3, a portion of SEQ ID NO:1, and a portion of SEQ ID NO:3;
- b) operably linking said nucleic acid sequence of interest, said promoter sequence, and said one or more age regulatory sequences to produce a transgene; and
- 15 c) introducing said transgene into said cell to create a treated cell under conditions such that said nucleic acid sequence of interest is expressed in said treated cell.

3. A substantially purified nucleic acid sequence comprising at least a portion of SEQ ID NO:93.

20 4. The nucleic acid sequence of Claim 1, wherein said portion has age-related regulatory activity.

25 5. The nucleic acid sequence of Claim 1, wherein said portion is selected from SEQ ID NO:91, SEQ ID NO:94, SEQ ID NO:95; SEQ ID NO:96, SEQ ID NO:97, SEQ ID NO:98, SEQ ID NO:99, SEQ ID NO:100, SEQ ID NO:101, SEQ ID NO:102, SEQ ID NO:103, SEQ ID NO:104, SEQ ID NO:105, SEQ ID NO:106, SEQ ID NO:107, SEQ ID NO:108, SEQ ID NO:109, SEQ ID NO:110, SEQ ID NO:111, SEQ ID NO:112, SEQ ID NO:113, SEQ ID NO:114, SEQ ID NO:115, SEQ ID NO:116, SEQ ID NO:117, SEQ ID NO:118, SEQ ID NO:119, SEQ ID NO:120, SEQ ID NO:121, SEQ ID NO:122, SEQ ID NO:123, SEQ ID NO:124, SEQ ID NO:125, SEQ ID NO:126, SEQ ID NO:127, SEQ ID NO:128, SEQ ID NO:129, SEQ ID NO:130, SEQ ID NO:131, SEQ ID NO:132, SEQ ID NO:133, SEQ ID NO:134, SEQ ID NO:135, SEQ ID NO:136, SEQ ID NO:137, SEQ ID

NO:138, SEQ ID NO:139, SEQ ID NO:140, SEQ ID NO:141, SEQ ID NO:142, SEQ ID NO:143, and SEQ ID NO:144.

6. The nucleic acid sequence of Claim 3, wherein said portion is SEQ ID NO:91.

5

7. A recombinant expression vector comprising in operable combination i) a nucleic acid sequence of interest, ii) a promoter sequence, and iii) an age-related regulatory sequence selected from SEQ ID NO:93 and portions thereof.

10

8. The expression vector of Claim 7, , wherein said nucleic acid sequence of interest encodes a protein selected from factor VIII, factor VII, factor IX, factor X, prothrombin, protein C, antithrombin III, tissue factor pathway inhibitor, LDL-receptor, human α 1-antitrypsin, antithrombin III, PEA-3 protein, β -galactosidase, and luciferase.

15

9. The expression vector of Claim 7, wherein said promoter sequence is selected from human factor IX promoter, cytomegalovirus promoter, tRNA promoter, 5S rRNA promoters, histone gene promoters, RSV promoter, retrovirus LTR promoter, SV40 promoter, PEPCK promoter, MT promoter, SR α promoter, P450 family promoters, GAL7 promoter, T, promoter, T₃ promoter, SP6 promoter, K11 promoter, and HIV promoter.

20

10. The expression vector of Claim 7, , wherein said portion of SEQ ID NO:93 is selected from SEQ ID NO:91, SEQ ID NO:94, SEQ ID NO:95; SEQ ID NO:96, SEQ ID NO:97, SEQ ID NO:98, SEQ ID NO:99, SEQ ID NO:100, SEQ ID NO:101, SEQ ID NO:102, SEQ ID NO:103, SEQ ID NO:104, SEQ ID NO:105, SEQ ID NO:106, SEQ ID NO:107, SEQ ID NO:108, SEQ ID NO:109, SEQ ID NO:110, SEQ ID NO:111, SEQ ID NO:112, SEQ ID NO:113, SEQ ID NO:114, SEQ ID NO:115, SEQ ID NO:116, SEQ ID NO:117, SEQ ID NO:118, SEQ ID NO:119, SEQ ID NO:120, SEQ ID NO:121, SEQ ID NO:122, SEQ ID NO:123, SEQ ID NO:124, SEQ ID NO:125, SEQ ID NO:126, SEQ ID NO:127, SEQ ID NO:128, SEQ ID NO:129, SEQ ID NO:130, SEQ ID NO:131, SEQ ID NO:132, SEQ ID NO:133, SEQ ID NO:134, SEQ ID NO:135, SEQ ID NO:136, SEQ ID NO:137, SEQ ID NO:138, SEQ ID NO:139, SEQ ID NO:140, SEQ ID NO:141, SEQ ID NO:142, SEQ ID NO:143, and SEQ ID NO:144.

11. The expression vector of Claim 10, , wherein said portion is SEQ ID NO:91.

12. The expression vector of Claim 7, further comprising in operable combination an age-related regulatory sequence selected from SEQ ID NO:1 and portions thereof.

5

13. A host cell containing the recombinant expression vector of Claim 7.

14. The host cell of Claim 13, wherein said host cell is comprised in a tissue or organ in a living animal.

10

15. The host cell of Claim 13, wherein said host cell is a gamete.

16. The host cell of Claim 13, wherein said host cell is selected from bacterial cell, yeast cell, plant cell, insect cell, and mammalian cell.

15

17. A method for expressing a nucleic acid sequence of interest, comprising:

a) providing:

- i) a cell;
- ii) a nucleic acid sequence of interest;
- iii) a promoter sequence; and
- iv) an age-related regulatory sequence selected from SEQ ID NO:93 and portions thereof;

20 b) operably linking said nucleic acid sequence of interest, said promoter sequence, and said age-related regulatory sequence to produce a transgene; and

25

c) introducing said transgene into said cell to create a treated cell under conditions such that the nucleic acid sequence of interest is expressed in said treated cell.

18. The method of Claim 17, wherein said treated cell is comprised in a tissue or organ in a living animal.

30

19. A substantially purified nucleic acid sequence comprising a nucleotide sequence selected from at least a portion of SEQ ID NO:85, and at least a portion of SEQ ID NO:92.

5 20. A method for expressing a nucleic acid sequence of interest, comprising:

a) providing:

- i) a cell;
- ii) a nucleic acid sequence of interest;
- iii) a promoter sequence; and

10 iv) a nucleotide sequence having activity selected from age-related regulatory activity and regulatory activity, said nucleotide sequence selected from SEQ ID NO:92, a portion of SEQ ID NO:92, SEQ ID NO:85, a portion of SEQ ID NO:85, SEQ ID NO:89, and SEQ ID NO:90;

15 b) operably linking said nucleic acid sequence of interest, said promoter sequence, and said nucleotide sequence to produce a transgene; and

c) introducing said transgene into said cell to create a treated cell under conditions such that the nucleic acid sequence of interest is expressed in said treated cell.